General

Guideline Title

Reducing adverse drug events in older adults. In: Evidence-based geriatric nursing protocols for best practice.

Bibliographic Source(s)

Zwicker D, Fulmer T. Reducing adverse drug events. In: Boltz M, Capezuti E, Fulmer T, Zwicker D, editor(s). Evidence-based geriatric nursing protocols for best practice. 4th ed. New York (NY): Springer Publishing Company; 2012. p. 324-62.

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Zwicker D, Fulmer T. Reducing adverse drug events. In: Capezuti E, Zwicker D, Mezey M, Fulmer T, editor(s). Evidence-based geriatric nursing protocols for best practice. 3rd ed. New York (NY): Springer Publishing Company; 2008. p. 257-308.

Recommendations

Major Recommendations

Levels of evidence (I–VI) are defined at the end of the "Major Recommendations" field.

Assessment Tools and Strategies

Assessment Tools

Use appropriate assessment tools as indicated for each individual's needs and specific setting:

- *Beers Criteria for Potentially Inappropriate Medication Use in Older Adults. Part I: 2002 Criteria Independent of Diagnoses or Conditions, Beers Criteria for Potentially Inappropriate Medication Use in Older Adults Part II: 2002 Criteria Considering Diagnoses or Conditions* (see the "Availability of Companion Documents" field).
- Common drug–drug interactions (see Table 17.1 in the original guideline document). List of some commonly known interactions.
- Cockroft-Gault formula to estimate renal function (see Table 17.2 in the original guideline document).
- Functional capacity (activity of daily living [ADL], independent activity of daily living [IADL], Mini-Cog, or Mini-Mental State Exam [MMSE]): assess ability to self-administer medications (see the National Guideline Clearinghouse [NGC] summaries of the Hartford Institute for Geriatric Nursing guidelines Assessment of physical function and Assessing cognitive functioning).
- Brown bag method (Nathan et al., 1999 [Level IV]). Method used to assess all medications an older adult has at home, including prescriptions from all providers, over-the-counter (OTC) medications, and herbal remedies (all medications are to be brought in a brown

bag). Should be used in conjunction with a complete medication history (see Table 17.3 in original guideline document).
- Drugs Regimen Unassisted Grading Scale (DRUGS) tool. Assessment of self-administration ability (Edelberg, Shallenberger, & Wei, 1999 [Level IV]; Hutchison et al., 2006 [Level IV]).

Assessment Strategies

- Comprehensive medication assessment should be performed at admission, discharge, and intervals in between (Petrone & Katz, 2005 [Level IV]; Shekelle et al., 2001). Obtain a detailed medication history and confirm its accuracy (Brown et al., 2003 [Level IV]) detailing the type and amount of prescriptions, OTCs, vitamins, supplements, and herbal remedies (Hanlon et al., 2001 [Level V]; Kaufman et al., 2002 [Level IV]), and alcohol and illicit drugs, using appropriate assessment tool (e.g., brown bag method) (Nathan et al., 1999 [Level IV]).
- Assess for medication- and patient-related risk factors for adverse drug reactions (ADRs) (see Table 17.4 in the original guideline document).
- Assess renal function using Cockroft-Gault formula prior to administering renal clearing drugs (see Table 17.2 in the original guideline document).
- Reconciliation of medications from home or other levels of care with medications ordered at admission and at discharge in consultation with a pharmacist, geriatric expert, or computer-based program (Gleason et al., 2004 [Level IV]; Joanna Briggs Institute, 2006 [Level I]; Santell, 2006; Simon et al., 2006 [Level II]).
- Review medication list using Beers criteria for potentially inappropriate medications, particularly those with *high severity* and for potential drug–drug and drug–disease interactions (Fick et al., 2003 [Level VI]; Rochon, 2006 [Level V]; Zhan et al., 2005 [Level IV]).
- At discharge from hospital, use appropriate tools to assess individual's ability to self-administer medications:
  - Assess functional capacity: ADLs, IADLs, Mini-Cog (see the NGC summaries of the Hartford Institute for Geriatric Nursing guidelines Assessment of physical function and Assessing cognitive functioning).
  - Assess individuals (at admission or initial encounter and at discharge) who administer their own medicines with DRUGS tool to identify potential areas of self-administration difficulty (Edelberg, Shallenberger, & Wei, 1999 [Level IV]; Hutchison et al., 2006 [Level IV]).

Interventions

Reducing Adverse Drug Events (ADEs) (During and Post Hospitalization)

- *Patient empowerment*. Patients should be given the necessary information and the opportunity to exercise the degree of control they choose over health care decisions that affect them. If patients are involved in decision making, they are less likely to make decisions that may lead to ADRs, such as abruptly discontinuing a medication that should be tapered off (Aspden et al., 2007 [Level VI]; National Coordinating Council for Medication Errors Reporting and Prevention [NCC MERP], 2001 [Level VI]).
- *Comprehensive medication history* on admission as indicated in Table 17.3 in the original guideline document.
- *Collaborate with the interdisciplinary team* to effect change in reducing the numbers of ADEs and ADRs, many of which are preventable (Hanlon et al., 2001 [Level V]).
- *Prescribing principles*. Although bedside nurses are not involved in prescribing, they are involved in reviewing and signing off medications, thus should be aware of prescribing principles. Monitoring for appropriate prescribing and alerting the prescriber to potential problem areas helps reduce medication-related problems. Prescribing a medication is multifaceted: deciding that a drug is truly indicated; choosing the best drug; determining appropriate dose for the individual; monitoring for toxicity and effectiveness; and seeking consultation when necessary (Rochon, 2006 [Level V]). These principles support recommendations to:
  - *Reduce the dose*. "Start Low and Go Slow" or give the lowest possible dose when starting a medication and slow upward titration to obtain clinical benefit; many ADEs are dose-related (Petrone & Katz, 2005 [Level IV]; Rochon, 2006 [Level V]). Primary provider should be notified if the dosage ordered is higher than the recommended starting dose (e.g., digoxin maximum dose, 0.125 mg for treatment of *systolic* heart failure) (Fick et al., 2003 [Level VI]).
  - *Discontinue unnecessary therapy*. Prescribers are often reluctant to stop medications, especially if they did not initiate the treatment. This practice increases the risk for an adverse event (Rochon, 2006 [Level V]).
  - Attempt a *trial of nonpharmacological interventions* and treatments prior to requesting medication for new symptoms (Rochon, 2006 [Level V]).
  - *Recommend safer drugs*. Avoid drugs that are likely to be associated with adverse outcomes (review Beers criteria) (Petrone & Katz, 2005 [Level IV]).
  - *Assess renal function* using Cockroft-Gault formula (for renally cleared drugs) to determine accurate dosage prior to prescribing such as many routinely prescribed intravenous (IV) antibiotics. Dosage recommendations are available based on this formula are presented in common prescribing resources.

- *Optimize drug regimen*. When prescribing medications, the focus should be on risk versus benefit where the expected health benefit (e.g., relief of agitation in dementia with psychosis) exceeds the expected negative consequences (e.g., morbidity and mortality from falls that result in hip fracture) (Leipzig, Cumming, & Tinetti, 1999 [Level I]; Ooi, Hossain, & Lipsitz, 2000 [Level II]; Rochon, 2006 [Level V]).
- *Initiation of new medication*. Assess risk factors for ADRs, potential drug–disease and drug–drug interactions, and correct dosages (Doucette et al., 2005 [Level V]; NCC MERP, 2001 [Level VI]; Petrone & Katz, 2005 [Level IV]). See Tables 17.1 and 17.4 in the original guideline document.
- *Avoid the prescribing cascade*. Avoid the prescribing cascade by *first* considering any new symptom as being an adverse effect of a current medication prior to adding a new medication (Rochon, 2006 [Level V]; Rochon & Gurwitz, 1997 [Level V]).
- *Avoid inappropriate medications*. Review criteria for potential inappropriate medications, drug–disease interactions, and potential drug–drug interactions (Fick et al., 2003 [Level VI]).
- *Employ nonpharmacological approaches* for symptoms (e.g., therapeutic activity kit for agitation) (Zwicker & Fletcher, 2009 [Level VI]).

Specific Interventions for Prevention of Iatrogenic ADRs (in Hospital and After Discharge)

- Consider any new symptom as a possible ADR before requesting or administering new medication for the symptom, avoiding the prescribing cascade (Gurwitz et al., 2005 [Level II]).
- Monitor medication orders for wrong drug choices (high-risk inappropriate medications, drug–disease, and drug–drug interactions), wrong dosages, or administration errors (Doucette et al., 2005 [Level V]; Gurwitz et al., 2005 [Level II]; Hanlon et al., 1997 [Level IV]). Consider use of technological handheld devices such as personal digital assistant (PDA) for quick access to Beers criteria, drug–drug or drug–disease interactions, and geriatric assessment tools (see the "Topic Resources" section on the Hartford Institute for Geriatric Nursing Web site).
- Improve prescribing practices by documenting indication for initiation of new drug therapy, maintaining a current medication list, documenting response to therapy, as well as the need for ongoing treatment, and evaluating comorbidities (Merle et al., 2005 [Level VI]).
- Institutional implementation of computer-assisted technology for medication order entry (Agency for Healthcare Research and Quality [AHRQ], 2001 [Level I]). Identifying and reporting ADRs can also be performed using computer-assisted national surveillance system.
- Institutions must facilitate a culture of safety to reduce ADRs or ADEs (Kohn, Corrigan, & Donaldson, 2000 [Level VI]).

Interventions at Discharge

- *Reconciliation* of medications at discharge helps to reduce ADRs or ADEs and rehospitalization (Gleason et al., 2004 [Level IV]; Nickerson et al., 2005 [Level II]).
- *Assess abilities and limitations* and health literacy in self-administration of medications using appropriate tools at discharge and recognize that self-administration and nonadherence can induce ADRs (Curry et al., 2005 [Level VI]; Merle et al., 2005 [Level VI]).
- *Assess for adherence* issues that may develop after discharge, which can help to reduce ADEs and rehospitalization (Bergman-Evans, 2006 [Level V]; Edelberg, Shallenberger, & Wei, 1999 [Level IV]; Fulmer et al., 2000 [Level V]; Nickerson et al., 2005 [Level II]). Recommend devices that can assist in enhancing adherence, behavior, and interventions to address cost and other adherence issues.
- *Patient/caregiver education*. Provide patient and caregiver education using relevant nursing content and principles including assessment of factors that might affect adherence. Nurses are the primary source for providing education to patients at discharge; therefore, their role is key to preventing medication-related consequences after hospitalization, including rehospitalization (Curry et al., 2005 [Level VI]). Discharge education and counseling includes the following:
  - Education tailored to the age group and needs of the individual (Bergman-Evans, 2006 [Level V])
  - Educate the patient and caregiver about benefits and risks and potential medication side effects (Rochon, 2006 [Level V]; Shekelle et al., 2001).
  - Teach safe medication management; use teach-back as a methodology (Curry et al., 2005 [Level VI]; Schillinger et al., 2003).
  - Consider an interactive computer program (personal education program) designed for the learning styles and psychomotor skills of older adults to teach about potential drug interactions that can result from self-medication with OTC agents and alcohol (Neafsey et al., 2002 [Level II]).

Follow-up

Health care providers will:

- Provide consistent and appropriate care and follow-up in presence of a medication-related problem.
- Monitor and evaluate with physical exam and/or laboratory tests (as appropriate) on regular basis to ensure that the older adult is

responding to therapy as expected (Edelberg, Shallenberger, & Wei, 1999 [Level IV]).

Institutions will:

- Provide ongoing assessment of staff competence in assessing and intervening for prevention of ADEs.
- Embed reduction of ADEs in the institution's culture of safety.

Definitions:

Levels of Evidence

Level I: Systematic reviews (integrative/meta-analyses/clinical practice guidelines based on systematic reviews)

Level II: Single experimental study (randomized controlled trials [RCTs])

Level III: Quasi-experimental studies

Level IV: Non-experimental studies

Level V: Care report/program evaluation/narrative literature reviews

Level VI: Opinions of respected authorities/consensus panels

AGREE Next Steps Consortium (2009). Appraisal of guidelines for research & evaluation II. Retrieved from http://www.agreetrust.org/?o=1397 .

Adapted from: Melnyck, B. M. & Fineout-Overholt, E. (2005). Evidence-based practice in nursing & health care: A guide to best practice. Philadelphia, PA: Lippincott Williams & Wilkins and Stetler, C.B., Morsi, D., Rucki, S., Broughton, S., Corrigan, B., Fitzgerald, J., et al. (1998). Utilization-focused integrative reviews in a nursing service. Applied Nursing Research, 11(4) 195-206.

Clinical Algorithm(s)

None provided

Scope

Disease/Condition(s)

Adverse drug events (ADEs):

- Drug-drug interactions
- Drug-disease interactions
- Iatrogenic ADEs
- Poor medication adherence
- Pharmacodynamics
- Polypharmacy

Guideline Category

Management

Prevention

Risk Assessment

Clinical Specialty

Critical Care

Family Practice

Geriatrics

Nursing

Pharmacology

Intended Users

Advanced Practice Nurses

Allied Health Personnel

Health Care Providers

Nurses

Pharmacists

Physician Assistants

Physicians

Guideline Objective(s)

To provide a standard of practice protocol to proactively identify older adults at risk for adverse drug events (ADEs) and reduce the likelihood of ADEs

Target Population

Older adults

Interventions and Practices Considered

Assessment/Evaluation/Risk Assessment

1. Use of appropriate assessment tools, including Beers criteria for potentially inappropriate medications
2. Detailed medication history
3. Assessment for risk factors
4. Assessment of renal function
5. Assessment of patient's ability to self-administer medications at discharge

Management/Prevention

1. Reduction of adverse drug events (ADE)
    - Patient empowerment
    - Comprehensive medication assessment
    - Collaboration with interdisciplinary team
    - Prescribing principles
2. Prevention of iatrogenic ADEs
    - Consideration of new symptoms
    - Monitoring of medication orders
    - Improvement of prescribing practices and documentation
    - Computer-assisted technology for medication order entry

3. Patient/caregiver education
4. Follow-up monitoring

Major Outcomes Considered

- Drug-drug interactions
- Drug-disease interactions
- Inappropriate prescribing
- Poor medication adherence
- Medication errors

Methodology

Methods Used to Collect/Select the Evidence

Hand-searches of Published Literature (Primary Sources)

Hand-searches of Published Literature (Secondary Sources)

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

Although the Appraisal of Guidelines for Research and Evaluation (AGREE) instrument (described in Chapter 1 of the original guideline document, *Evidence-based Geriatric Nursing Protocols for Best Practice,* 4th ed.) was created to critically appraise clinical practice guidelines, the process and criteria can also be applied to the development and evaluation of clinical practice protocols. Thus, the AGREE instrument has been expanded (i.e., AGREE II) for that purpose to standardize the creation and revision of the geriatric nursing practice guidelines.

The Search for Evidence Process

Locating the best evidence in the published research is dependent on framing a focused, searchable clinical question. The PICO format—an acronym for population, intervention (or occurrence or risk factor), comparison (or control), and outcome—can frame an effective literature search. The editors enlisted the assistance of the New York University Health Sciences librarian to ensure a standardized and efficient approach to collecting evidence on clinical topics. A literature search was conducted to find the best available evidence for each clinical question addressed. The results were rated for level of evidence and sent to the respective chapter author(s) to provide possible substantiation for the nursing practice protocol being developed.

In addition to rating each literature citation as to its level of evidence, each citation was given a general classification, coded as "Risks," "Assessment," "Prevention," "Management," "Evaluation/Follow-up," or "Comprehensive." The citations were organized in a searchable database for later retrieval and output to chapter authors. All authors had to review the evidence and decide on its quality and relevance for inclusion in their chapter or protocol. They had the option, of course, to reject or not use the evidence provided as a result of the search or to dispute the applied level of evidence.

Developing a Search Strategy

Development of a search strategy to capture best evidence begins with database selection and translation of search terms into the controlled vocabulary of the database, if possible. In descending order of importance, the three major databases for finding the best primary evidence for most clinical nursing questions are the Cochrane Database of Systematic Reviews, Cumulative Index to Nursing and Allied Health Literature (CINAHL), and Medline or PubMed. In addition, the PsycINFO database was used to ensure capture of relevant evidence in the psychology and behavioral sciences literature for many of the topics. Synthesis sources such as UpToDate® and British Medical Journal (BMJ) Clinical Evidence and abstract journals such as *Evidence Based Nursing* supplemented the initial searches. Searching of other specialty databases may have to be warranted depending on the clinical question.

It bears noting that the database architecture can be exploited to limit the search to articles tagged with the publication type "meta-analysis" in

Medline or "systematic review" in CINAHL. Filtering by standard age groups such as "65 and over" is another standard categorical limit for narrowing for relevance. A literature search retrieves the initial citations that begin to provide evidence. Appraisal of the initial literature retrieved may lead the searcher to other cited articles, triggering new ideas for expanding or narrowing the literature search with related descriptors or terms in the article abstract.

Number of Source Documents

Not stated

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Levels of Evidence

Level I: Systematic reviews (integrative/meta-analyses/clinical practice guidelines based on systematic reviews)

Level II: Single experimental study (randomized controlled trials [RCTs])

Level III: Quasi-experimental studies

Level IV: Non-experimental studies

Level V: Care report/program evaluation/narrative literature reviews

Level VI: Opinions of respected authorities/consensus panels

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Adapted from: Melnyck, B. M. & Fineout-Overholt, E. (2005). Evidence-based practice in nursing & health care: A guide to best practice. Philadelphia, PA: Lippincott Williams & Wilkins and Stetler, C.B., Morsi, D., Rucki, S., Broughton, S., Corrigan, B., Fitzgerald, J., et al. (1998). Utilization-focused integrative reviews in a nursing service. Applied Nursing Research, 11(4) 195-206.

Methods Used to Analyze the Evidence

Review of Published Meta-Analyses

Systematic Review

Description of the Methods Used to Analyze the Evidence

Not stated

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

Not stated

Rating Scheme for the Strength of the Recommendations

Not applicable

Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

Method of Guideline Validation

External Peer Review

Internal Peer Review

Description of Method of Guideline Validation

Not stated

Evidence Supporting the Recommendations

References Supporting the Recommendations

Agency for Healthcare Research and Quality (AHRQ). Reducing and preventing adverse drug events to decrease hospital costs [AHRQ Publication #01-0020]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2001 Mar. (Research in Action; no. 1).

Aspden P, Wolcott JA, Bootman JL, Cronenwett LR, editor(s). Preventing medication errors. Washington (DC): The National Academies Press; 2007.

Bergman-Evans B. AIDES to improving medication adherence in older adults. Geriatr Nurs. 2006 May-Jun;27(3):174-82; quiz 183. [79 references] PubMed

Brown AF, Mangione CM, Saliba D, Sarkisian CA, California Healthcare Foundation/Am Geriatrics Society Panel on Improving Care for Elders w/Diabetes. Guidelines for improving the care of the older person with diabetes mellitus. J Am Geriatr Soc. 2003 May;51(5 Suppl Guidelines):S265-80. PubMed

Curry LC, Walker C, Hogstel MO, Burns P. Teaching older adults to self-manage medications: preventing adverse drug reactions. J Gerontol Nurs. 2005 Apr;31(4):32-42. PubMed

Doucette WR, McDonough RP, Klepser D, McCarthy R. Comprehensive medication therapy management: identifying and resolving drug-related issues in a community pharmacy. Clin Ther. 2005 Jul;27(7):1104-11. PubMed

Edelberg HK, Shallenberger E, Wei JY. Medication management capacity in highly functioning community-living older adults: detection of early deficits. J Am Geriatr Soc. 1999 May;47(5):592-6. PubMed

Fick DM, Cooper JW, Wade WE, Waller JL, Maclean JR, Beers MH. Updating the Beers criteria for potentially inappropriate medication

use in older adults: results of a US consensus panel of experts. Arch Intern Med. 2003 Dec 8-22;163(22):2716-24. PubMed

Fulmer T, Kim TS, Montgomery K, Lyder C. What the literature tells us about the complexity of medication compliance in the elderly. Generations. 2000;24(4):43-8.

Gleason KM, Groszek JM, Sullivan C, Rooney D, Barnard C, Noskin GA. Reconciliation of discrepancies in medication histories and admission orders of newly hospitalized patients. Am J Health Syst Pharm. 2004 Aug 15;61(16):1689-95. PubMed

Gurwitz JH, Field TS, Judge J, Rochon P, Harrold LR, Cadoret C, Lee M, White K, LaPrino J, Erramuspe-Mainard J, DeFlorio M, Gavendo L, Auger J, Bates DW. The incidence of adverse drug events in two large academic long-term care facilities. Am J Med. 2005 Mar;118(3):251-8. PubMed

Hanlon JT, Fillenbaum GG, Ruby CM, Gray S, Bohannon A. Epidemiology of over-the-counter drug use in community dwelling elderly: United States perspective. Drugs Aging. 2001;18(2):123-31. [40 references] PubMed

Hanlon JT, Schmader KE, Koronkowski MJ, Weinberger M, Landsman PB, Samsa GP, Lewis IK. Adverse drug events in high risk older outpatients. J Am Geriatr Soc. 1997 Aug;45(8):945-8. PubMed

Hutchison LC, Jones SK, West DS, Wei JY. Assessment of medication management by community-living elderly persons with two standardized assessment tools: a cross-sectional study. Am J Geriatr Pharmacother. 2006 Jun;4(2):144-53. PubMed

Joanna Briggs Institute. Strategies to reduce medication errors with reference to older adults. Nurs Stand. 2006 Jun 21-27;20(41):53-7. [32 references] PubMed

Kaufman DW, Kelly KP, Rosenberg L, Anderson TE, Mitchell AA. Recent patterns of medication use in the ambulatory adult population in the United States. The Sloane Survey. JAMA. 2002;287:377-44.

Kohn LT, Corrigan JM, Donaldson MS, editor(s). To err is human: building a safer health system. Washington (DC): National Academy Press; 2000.

Leipzig RM, Cumming RG, Tinetti ME. Drugs and falls in older people: a systematic review and meta-analysis: I. Psychotropic drugs. J Am Geriatr Soc. 1999 Jan;47(1):30-9. PubMed

Merle L, Laroche ML, Dantoine T, Charmes JP. Predicting and preventing adverse drug reactions in the very old. Drugs Aging. 2005;22(5):375-92. [98 references] PubMed

Nathan A, Goodyer L, Lovejoy A, Rashid A. 'Brown bag' medication reviews as a means of optimizing patients' use of medication and of identifying potential clinical problems. Fam Pract. 1999 Jun;16(3):278-82. PubMed

National Coordinating Council for Medication Error Reporting and Prevention. Taxonomy of medication errors. Oakbrook Terrace (IL): National Coordinating Council for Medication Error Reporting and Prevention; 2001. 19 p.

Neafsey PJ, Strickler Z, Shellman J, Chartier V. An interactive technology approach to educate older adults about drug interactions arising from over-the-counter self-medication practices. Public Health Nurs. 2002 Jul-Aug;19(4):255-62. PubMed

Nickerson A, MacKinnon NJ, Roberts N, Saulnier L. Drug-therapy problems, inconsistencies and omissions identified during a medication reconciliation and seamless care service. Healthc Q. 2005;8 Spec No:65-72. PubMed

Ooi WL, Hossain M, Lipsitz LA. The association between orthostatic hypotension and recurrent falls in nursing home residents. Am J Med. 2000 Feb;108(2):106-11. PubMed

Petrone K, Katz P. Approaches to appropriate drug prescribing for the older adult. Prim Care. 2005 Sep;32(3):755-75. [30 references] PubMed

Rochon PA, Gurwitz JH. Optimising drug treatment for elderly people: the prescribing cascade. BMJ. 1997 Oct 25;315(7115):1096-9. [27 references] PubMed

Rochon PA. Drug prescribing for older adults. In: UpToDate [internet]. Baltimore (MD): Wolters Kluwer Health; 2006 [accessed 2006 Sep 15].

Santell JP. Reconciliation failures lead to medication errors. Jt Comm J Qual Patient Saf. 2006 Apr;32(4):225-9. PubMed

Schillinger D, Piette J, Grumbach K, Wang F, Wilson C, Daher C, Leong-Grotz K, Castro C, Bindman AB. Closing the loop: physician communication with diabetic patients who have low health literacy. Arch Intern Med. 2003 Jan 13;163(1):83-90. PubMed

Shekelle PG, MacLean CH, Morton SC, Wenger NS. Acove quality indicators. Ann Intern Med. 2001 Oct 16;135(8 Pt 2):653-67. PubMed

Simon SR, Smith DH, Feldstein AC, Perrin N, Yang X, Zhou Y, Platt R, Soumerai SB. Computerized prescribing alerts and group academic detailing to reduce the use of potentially inappropriate medications in older people. J Am Geriatr Soc. 2006 Jun;54(6):963-8. PubMed

Zhan C, Correa-de-Araujo R, Bierman AS, Sangl J, Miller MR, Wickizer SW, Stryer D. Suboptimal prescribing in elderly outpatients: potentially harmful drug-drug and drug-disease combinations. J Am Geriatr Soc. 2005 Feb;53(2):262-7. PubMed

Zwicker D, Fletcher K. Evidence based nonpharmacologic interventions for agitation. 2009.

Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for selected recommendations (see the "Major Recommendations" field).

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Patients

- Fewer iatrogenic outcomes from medication-related events
- Understanding of medication regimens upon discharge from the hospital

Health Care Providers

- Use of a range of interventions to prevent, alleviate, or ameliorate medication problems with older adults
- Improvement of prescribing practices by documentation of indication for initiation of new drug therapy, maintenance of a current medication list, documentation of response to therapy, as well as the need for ongoing treatment
- Evaluation of the nature and origins of medication-related problems in a timely manner
- Increased knowledge about medication safety in older adults
- Increased referrals to appropriate practitioners for collaboration and medication safety (e.g., pharmacist, geriatrician, geriatric/gerontological or psychiatric clinical nurse specialist, nurse practitioner, or consultation-liaison service)

Institution

- Provision of a culture of safety that encourages safe medication practices
- Provision of education to health care providers regarding prevention, identification, and reporting of adverse drug reactions (ADRs)
- Improved patient accessibility to information on ADRs
- Enhanced surveillance and reporting of ADRs using a national surveillance system. Use of computerized physician ordering system as appropriate.
- Tracking and reporting of morbidity and mortality due to medication-related problems
- Provision of a system for medication reconciliation and follow-up its effectiveness with regard to rehospitalization rates due to ADRs
- Review for careful documentation of iatrogenic medication and other iatrogenic events for continuous quality improvement (CQI)
- Provision of ongoing education related to safe medication management for physicians, other licensed independent providers, and nursing staff

Potential Harms

Not stated

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Implementation Tools

Mobile Device Resources

Resources

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

Living with Illness

Staying Healthy

IOM Domain

Effectiveness

Patient-centeredness

Safety

Identifying Information and Availability

Bibliographic Source(s)

Zwicker D, Fulmer T. Reducing adverse drug events. In: Boltz M, Capezuti E, Fulmer T, Zwicker D, editor(s). Evidence-based geriatric nursing protocols for best practice. 4th ed. New York (NY): Springer Publishing Company; 2012. p. 324-62.

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2008 (revised 2012)

Guideline Developer(s)

Hartford Institute for Geriatric Nursing - Academic Institution

Guideline Developer Comment

The guidelines were developed by a group of nursing experts from across the country as part of the Nurses Improving Care for Health System Elders (NICHE) project, under sponsorship of the Hartford Institute for Geriatric Nursing, New York University College of Nursing.

Source(s) of Funding

Hartford Institute for Geriatric Nursing

Guideline Committee

Not stated

Composition of Group That Authored the Guideline

Primary Authors: DeAnne Zwicker, DrNP, APRN, BC, ANCC, Certified Adult Nurse Practitioner, Independent Geriatric Consultant; Terry Fulmer, PhD, RN, FAAN, Dean, the Bouve College of Health Sciences, Northeastern University, Boston, MA

Financial Disclosures/Conflicts of Interest

Not stated

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Zwicker D, Fulmer T. Reducing adverse drug events. In: Capezuti E, Zwicker D, Mezey M, Fulmer T, editor(s). Evidence-based geriatric nursing protocols for best practice. 3rd ed. New York (NY): Springer Publishing Company; 2008. p. 257-308.

Guideline Availability

Electronic copies: Available from the Hartford Institute for Geriatric Nursing Web site .

Copies of the book *Evidence-Based Geriatric Nursing Protocols for Best Practice*, 4th edition: Available from Springer Publishing Company, 536 Broadway, New York, NY 10012; Phone: (212) 431-4370; Fax: (212) 941-7842; Web: www.springerpub.com .

Availability of Companion Documents

The following are available:

- *Try This*® - issue 16: The 2012 American Geriatrics Society Updated Beers Criteria for Potentially Inappropriate Medication Use in Older Adults. New York (NY): Hartford Institute for Geriatric Nursing; 2 p. 2013. Electronic copies: Available in Portable Document Format (PDF) from the Hartford Institute of Geriatric Nursing Web site .
- Beers Criteria for Potentially Inappropriate Medication Use in Older Adults. How to Try This video. Available from the Hartford Institute for Geriatric Nursing Web site .

The ConsultGeriRN app for mobile devices is available from the Hartford Institute for Geriatric Nursing Web site .

Patient Resources

None available

NGC Status

This NGC summary was completed by ECRI Institute on June 17, 2008. The information was verified by the guideline developer on August 4, 2008. This NGC summary was updated by ECRI Institute on June 25, 2013. The updated information was verified by the guideline developer on August 6, 2013.

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